the retina of ordinary eyes. By far the most numerous are the long rods; but in addition, and between the latter, one finds a few cones." Both rods and cones contain nuclei, and are directly continuous with the nucleated cells of the nuclear layer (2). These cells are in turn continuous with the ganglion cells of the outermost layer (3), which send processes into the pineal stalk.

Beard's conclusions as to the method of evolution of the pineal eye are exceedingly interesting, but very hypothetical. He says, "I think the development does show that the parietal eye is a slightly later development than the paired eyes, and that the organ has developed in connection with the paired eyes." He starts with the views of Balfour and others, that the paired eyes once opened dorsally "on the surface of the unclosed neural plate," and as the nerve plate gradually sunk below the outer surface of the body, the "neural plate and eyes got shut in," and at the same time the eyes received light laterally, that is, from the sides of the body, or on the ends of their retinal cells which trail out into the nerves. Beard supposes that at the time of closure of the neural tube, a portion of the primary dorsal light-sensitive area became pinched off, as the median eye, which, as we have seen, would still receive its nerve supply from behind (invertebrate type); that by the involution of the optic cup of the lateral eyes they would receive their nerve supply on the same surface which received the light (vertebrate type).

Prof. Cope (7) has examined the skulls of some extinct vertebrates with reference to the pineal or parietal foramen. Referring to the skulls of two very old fishes, he says: "The structure of the primitive vertebrates strongly indicates the origin of lateral or paired eyes from a single median eye, such as is found in Tunicata." "Among North American extinct reptiles," he believes that Diadectes "relied exclusively on the pineal eye for the sense of sight," while in others in which the parietal foramen is closed, casts of the brain show an extemely large epiphysis, and at the same time in Belodon a communication with the orbit (of the lateral eyes) is established.

The work of P. Franchotte (8) on the epiphysis in Anguis covers about the same ground as that of de Graaf and Spencer on that animal.

Thus all the evidence which has come in points conclusively to the fact that the pineal body or gland developed primarily as a median pineal eye. A study of extinct forms shows a larger parietal foramen than found in existing forms, indicating in some, perhaps, a better developed pineal eye.

A study of living forms indicates an absence of function as an organ of sight, for in none are *nerve fibers* discovered connecting pineal eye with brain, though the nerve stalk is there. All the essentials necessary for sight are shown to have *at one time* existed, but the pineal body must now be relegated to the class of rudimentary organs. T. H. MORGAN.

The Pineal Body (Epiphysis Cerebri) in the Brains of the Walrus and Seals. Sir WILLIAM TURNER. Jour. of Anat. and Phys. Vol. XXII, 1888, pp. 300–303.

In this paper, which was read before the Royal Society of Edinburgh, in December 1887, Sir William Turner makes some interesting statements respecting the appearance, position, and relations of

the pineal body in the brains of the walrus and seal. In the brain of the former animal this organ is of unusual size, pyriform in shape, with the apex directed forwards to the optic thalami, to which it is attached. The base is free, and projects backwards so as to be visible, when the brain is examined from above, in the mesial longitudinal fissure between the two cerebral hemispheres. In *Phoca vitulina* the pineal body resembles that of the walrus, in possessing three surfaces and having its apex forwards. It projects behind the corpus callosum, and rests on the corpora quadrigemina and the anterior part of the middle lobe of the cerebellum, but does not appear between the two hemispheres of the cerebrum, when the brain is looked at from above, unless the hemispheres are drawn apart. The pineal body in *Macrorhinus leoninus* has the same shape as in *Phoca*, and possesses similar relations to the cerebrum and cerebellum. In the seals the epiphysis cerebri is larger than in mammals generally, and in the walrus it is about twice as large as in the seals. F. T.

II.—HYPNOTISM.

Eine experimentelle Studie auf dem Gebiete des Hypnotismus. Dr. R. v. KRAFFT-EBING. Stuttgart, 1888, pp. 80.

Prof. Krafft-Ebing has studied in detail a single case presenting peculiar hypnotic manifestations. The subject is a young woman of neurotic ancestry, whose own career is typically hysterical. Fearing her father's opposition to a love-match with her cousin, she went to a convent, where she seems to have been hypnotized by some of the sisters and urged to steal money. Fearing detection, she escapes, earns a precarious living, assumes male attire and becomes a private tutor for several years. She is often severely ill with hysterical attacks. Symptoms of kleptomania, of sexual perversion, and of suicidal tendency are also evident. At the time of investigation she is hemianaesthesic, the right side being affected, including the sense organs; and is subject to hystero-epileptic attacks. She is easily hypnotized, and often falls into a somnambulic condition which Prof. Krafft-Ebing takes as autohypnotism. She rather objects to being hypnotized, and though her story is not perfectly truthful, simulation is regarded as out of the question. All the usual hypnotic phenomena can be well demonstrated in her case, but only a few of the most striking call for remark. The ordinarily involuntary functions seem especially controllable in her hypnosis. If the shape of a letter, a glass cylinder, or scissors be held against her skin, with the suggestion that the article is red-hot, a fully developed scar is formed in the shape of the object applied. The same can be taken away by a suggestion, and if transferred from one side to the other becomes reversed as in mirror-script. The magnet has a powerful influence over her, inducing contractures, but as this influence is shared by any object in contact with a magnet, and the magnet itself fails when not in the hand of Prof. Krafft-Ebing, suggestion (perhaps by temperature changes) is evidently the *modus operandi*. She easily takes attitudes appropriate to suggested emotions and *vice versa*. But the experiment with drugs at a distance à la Luys is entirely without success. She easily assumes foreign roles, making her actions and handwriting suitable